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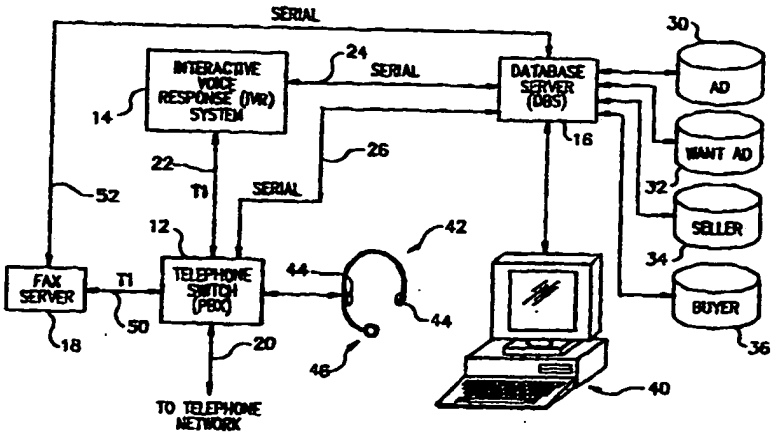

(57) Abstract

A computerized classified ad system and method. The system comprises a data processor (16) including means (30) for creating an ad database comprising a plurality of ads, each ad containing text data describing an item to be made available through the system. In a first aspect, the data processor (16) also includes means (40) for receiving profile data describing an item sought from others through the system, and for comparing the profile data to the ads and for generating text output data when matches are found. An interactive voice response system (14) converts the text output data into a voice message. In a second aspect, the data processor (16) includes means (32) for creating a want ad database comprising want ads that contain data describing items sought through the system and delivery data such as a buyer's phone number. When a new ad is placed in the ad database, it is also compared to the want ads. If a match is found, the system generates output data that includes the new ad and the delivery data for the matching want ad.

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COMPUTER-BASED CLASSIFIED AD SYSTEM AND METHOD

Field of the Invention

The present invention relates to a computerized classified ad system.

Background of the Invention

In the well known classified ad system used in most newspapers, a seller may place an ad offering an item for sale. The ad includes a description of the item, and a phone number or other information permitting a potential buyer to contact the seller. The ad then appears in the classified ad section of one or more editions of the newspaper, indexed according to the nature of the item offered for sale, e.g., real estate, automobile, etc. A potential buyer can read the classified ads in the newspaper, and then contact the sellers of any items that appear to match the buyer's need. This system is used not only for buy-sell transactions, but also for the leasing of real estate, for employment, for services offered, and for miscellaneous other matters.

The problems inherent in the above described classified ad system are well known and, for the most part, are taken for granted. A basic problem is that buyers must often scan a large number of ads to identify a relatively small number of items that may meet their needs. A second problem relates to timing; i.e., by the time that the buyer is able to contact the seller, the item may have already been sold. In addition, if a buyer does not locate a suitable item in a given day's newspaper, the buyer must in general do a complete search of the following day's newspaper, since ads are generally not segregated based upon whether they have been newly placed.

An attempt has been made to address some of the limitations of newspaper classified ads through the use of voice mail systems in which sellers' ads are stored as individual voice mail messages. A separate index is created, the index breaking

the voice ads down into categories in a manner similar to the categories used in newspaper classified ads. For example, an ad to sell an automobile might be placed in a category "auto for sale," and perhaps a subcategory indicating the car manufacturer. A buyer calling such a system specifies the categories in which he or she is interested, using touch tones, and then listens to the voice ads in the specified categories.

The basic problem with voice mail classified ad systems is the fact that the voice ads themselves are not searchable. Only the separately created index can be used by a buyer to locate ads meeting specified criteria. Because of the need to create a separate index, there may be a significant delay between when a seller calls an ad into the system, and when a buyer is able to retrieve the ad.

Summary of the Invention

The present invention provides a computer based classified ad system and method that is significantly more convenient and efficient than traditional newspaper classified ads and their voice mail counterparts.

In one aspect, the classified ad system of the present invention comprises data processing means including means for creating an ad database comprising a plurality of ads. Each ad contains text (as opposed to voice) data describing an item to be made available through the system, such as property offered for sale or lease, services available, employment available, etc. The data processing means further includes means for receiving profile data describing an item sought from others through the system, such as property desired for purchase or lease, services desired, or employment sought. Means are provided for comparing the profile data to the ads in the ad database, to determine if any of the ads match the profile and, if so, for generating text output data comprising such matching ads. The classified ad system also includes an interactive voice response system comprising means for storing words and/or phrases in voice form, means for receiving the output data from the data processing means, and means for assembling a voice output message corresponding to the output data from the stored words and/or phrases. In a preferred embodiment, interactive voice response system is coupled to a telephone network, so that the voice message can be delivered to a buyer or the like via a telephone network.

In another aspect, the data processing means includes means for creating an ad database, as described above, and also includes means for creating a want ad database comprising a plurality of want ads. Each want ad comprises description data describing an item sought from others through the system, such as property

desired to purchase or lease, services desired or employment sought. Each want ad also includes delivery data indicating how output from the system relating to the want ad should be delivered. The want ad database has no analog in the conventional newspaper based classified ad system. The data processing means also includes update means that responds to the receipt of a new ad by storing the new ad in the ad database, and by comparing the new ad to the want ads in the want ad database, to determine if any of the want ads match the new ad. If a match is determined to exist, the update means generates output data that includes the new ad and the delivery data for the matching want ads.

For the case in which the classified ad system of the present invention is used for buy-sell transactions, such as the sale of real estate, the ad database can be viewed as comprising ads placed by sellers, while the want ad database can be regarded as want ads placed by potential buyers. As outlined above, each time that a seller places a new ad in the system, the system compares the new ad to the buyer's want ads. When a match is found, the system generates output data that includes the new ad, plus delivery data from the matching want ads. The delivery data may comprise the phone numbers (voice or fax) of the buyers who place the want ads.

In a preferred embodiment, the classified ad system also comprises an interactive voice response system coupled to a telephone network. The interactive voice response system receives the output data generated by the update means, electronically dials the telephone number via the telephone network, and transmits at least a portion of the new ad to buyer, at the phone number contained in the matching want ad.

The significant advantages provided by the present invention are apparent from the above description. In contrast to the conventional newspaper system, the system of the present invention does not require the buyer to scan a large number of ads, or to repeatedly scan new editions of the newspaper. In the first mentioned aspect of the invention, the ability to search all of the information in an ad using conventional text database techniques is combined with the convenience of voice output. Further, because there is no separate index creation step, new ads are instantly available, creating a real time system. In the second mentioned aspect, the buyer simply places a want ad in the system. Thereafter, whenever a seller places a new ad, the buyer may be automatically and immediately notified of the contents of the new ad. Essentially, the system of the present invention assembles

a customized publication (fax) or audio production (voice) for the buyer in real time.

Brief Description of the Drawings

FIGURE 1 is a block diagram of one preferred embodiment of the classified ad system of the present invention.

FIGURE 2 is a flow chart showing the handling of an incoming call.

FIGURE 3 is a flow chart illustrating the placement of a new ad by a seller.

FIGURE 4 is a flow chart illustrating a search for matching want ads.

FIGURE 5 is a flow chart illustrating the callback routine.

FIGURE 6 is a flow chart illustrating the steps performed when a buyer requests a search.

FIGURE 7 is a flow chart illustrating a search of the ad database for ads matching a profile.

FIGURE 8 is a flow chart illustrating ad playback.

Detailed Description of a Preferred Embodiment

In the following description, it will be assumed that "sellers" wish to sell property (real estate, automobiles, etc.) to "buyers." However, the present invention is equally applicable to the leasing or renting of real or personal property, to employment (i.e., listing of positions available or positions wanted), to the offering of services, to locating persons with specified knowledge or interests, etc. In general, the system of the present invention can be applied to any field in which conventional classified ads are useful.

One preferred embodiment of the present invention is illustrated in block diagram form in FIGURE 1. This configuration comprises a telephone switch such as PBX (private branch exchange) 12, an interactive voice response (IVR) system 14, a database server (DBS) 16, and a FAX server 18. PBX 12 is connected to one or more telephone lines 20 through which users (buyers and sellers) may communicate with the system, either by voice or fax. A suitable PBX is the Summa/Four switch available from Summa. In general, any switch capable of responding to control by an external computer may be used.

IVR 14 is a computer specialized for storing digital audio scripts, and for playing back such scripts in response to digital or touch tone inputs. IVR 14 is coupled to PBX 12 via T1 telephone line 22, such that the IVR can be coupled directly to a user who calls the system via telephone line 20. However, in a preferred implementation of the present invention, the IVR preferably includes the ability to concatenate individual words or phrases to produce voice output.

An IVR with concatenation ability is to be contrasted with a simple voice mail system. In a voice mail system, one can store a number of voice scripts, and means for permitting a user to access different scripts depending upon touch tones or other data input by the user. Each script, however, is a complete message, and cannot be further broken down. This means that the individual words and other data within the script are not searchable. In contrast, in an IVR system with concatenation capability, individual words and/or phrases are stored in voice form, while the messages that will be built up from such words and phrases are stored in a conventional text-type database. When a message from the database is to be converted into voice form, the IVR retrieves the voice corresponding to each word or phrase, and concatenates these individual voice segments into a output voice message. Suitable IVR's with concatenation ability are the Voice Processing Series (VPS) models available from Periphonics.

DBS 16 is a general-purpose computer programmed for database operations. In the illustrated embodiment, DBS 16 manages four text (as opposed to voice) databases: ad database 30, want ad database 32, seller database 34, and buyer database 36. Ad database 30 comprises an electronic equivalent of the classified ads typically placed by sellers. Want ad database 32 comprises a collection of "want ads" placed by potential buyers. Each want ad describes the property sought by that buyer. Seller database 34 lists the sellers that have registered to use the system, while buyer database 36 lists the buyers that have registered to use the system. The seller and buyer databases may be regarded as extensions of the ad and want ad databases, respectively.

In a preferred embodiment of the invention adapted for the buying and selling of residential real estate, the fields in the ad and want ad databases include the following:

Ad Database	Want Ad Database
Geographic area where property is located	Geographic area desired
Asking price	Target price
Number of bedrooms	Number of bedrooms desired
Number of bathrooms	Number of bathrooms desired
View?	View required?
Large yard?	Large yard required?
Garage?	Garage required?
Basement?	Basement required?
Fireplace?	Fireplace required?

House style

Deck?

The fields listed above are illustrative only, and many other combinations could obviously be used to suit a particular application. A question mark after a field name indicates that the field contains either a yes or no, or equivalent data. Each of the fields in the ad database from "Geographic area" through "Fireplace?" have corresponding fields in the want ad database. These fields are referred to as "matching" fields, since they are used to match ads to want ads, as further described below. The last two fields listed for the ad database have no corresponding fields in the want ad database. These are referred to as "information" fields. The information fields are not used for matching ads to want ads, but represent additional information that can be provided to buyers concerning property for sale.

DBS 16 is coupled to IVR 14 via serial link 24, and to PBX 12 via serial link 26. The DBS includes terminal 40 through which an operator can interact with and control the DBS. Terminal 40 may be a conventional personal computer. The operator of terminal 40 wears headset 42 that includes headphones 44 and microphone 46. The headset is coupled to PBX 12, so that the operator can engage in conversations with callers via the PBX and telephone line 20.

FAX server 18 is coupled to PBX 12 via telephone line 50, and to DBS 16, via serial line 52. The FAX server may be a conventional personal computer with a fax board.

The operation of the system shown in FIGURE 1 is outlined in the flow charts of FIGURES 2-8. As indicated in FIGURE 2, the operation of the system is triggered by receipt of an incoming call to the PBX via telephone line 20. In step 100, the PBX first determines whether the incoming call is voice or fax. If fax, then step 102 connects the incoming call to fax server 18 via telephone line 50. The fax server receives the fax, and the fax may then be printed by a printer coupled to FAX server 18 or to DBS 16. As described further below, experienced sellers (i.e., real estate agents) may use fax rather than voice to transmit ads to the system for placement in the ad database.

If the incoming call is voice, then step 104 is executed. In this step, the PBX sends a message to DBS 16 via serial line 26, indicating that a new call has been received. In return, the DBS sends back a transaction identifier (TransId) that will be used to uniquely identify this call. In step 106, the PBX then connects the

call to the IVR via telephone line 22, and transmits the transaction identifier to the IVR via telephone line 22, using touch tone signals.

The steps in blocks 100-106 in FIGURE 2 are performed by PBX 12, while the remaining steps in this Figure are performed by IVR 14. In response to receipt of the transaction identifier from the PBX, the IVR in step 110 plays a pre-stored new caller voice script, and transmits this script to the caller via PBX 12 and telephone line 20. This script may include any introductory information, recently added features of the system, instructions on how to use the system, etc. The script then asks the caller to identify a desired function, for example by pressing designated touch tone keys on the caller's telephone. Block 112 then analyzes the function that the caller has requested, and routes control accordingly.

The principal functions that the caller may request depend upon whether the caller is a seller or buyer. If the caller is a seller, then the caller can ask to place a new ad in the system. If the caller is a buyer, then the caller can ask the system to search for ads that match its needs, and to place a new want ad. In a particular implementation, numerous other functions could be selected at this point. For a seller, such additional functions could include changing an existing ad, renewing or cancelling an ad, playing back an ad previously placed, and modifying information concerning the seller itself, such as its phone number or address, etc. For a buyer, such additional functions could include modifying, cancelling or renewing a previously placed want ad. These additional functions will not be described further because they are not central to the present invention, and because they are enhancements that can be routinely implemented by those skilled in the art, based upon the description of the basic functions set forth below.

If the incoming caller identifies itself as a seller wishing to place a new ad, then the IVR identifies this as a non-IVR based function, and sends an operator request message to DBS 16 via serial line 24, as shown in block 116 of FIGURE 2. In response to the operator request message, the DBS begins prompting the operator at terminal 40 for information relating to the ad. In turn, the operator relays these requests to the seller via headset 42 and switch 12, receives the seller's responses via the same path, and inputs such responses to DBS 16, to create a new ad in ad database 30. Although this step could be automated using the IVR, it is generally preferable to use a human operator as an interface, because of the amount of variability involved in placing an ad, explaining to the seller the options available, etc.

FIGURE 3 provides further details concerning the steps used to create a new ad in ad database 30. In step 150, the operator asks the seller to identify itself, such as by supplying a seller ID or other identifying information. The operator then checks seller database 34, to determine whether the seller is already registered in the system. If the caller is a new seller, then the operator obtains information from the seller in block 154, and the new seller is added to the seller database. In block 156, the operator asks the seller if it wishes to place a new ad, or another new ad, in the system. Assuming that the answer is yes, the operator obtains the information relating to the new ad in step 160. The information requested from the seller corresponds to the fields of the ad database described above, i.e., geographic location, price, bedrooms, bathrooms, etc. DBS 16 then assigns an ad identifier (AdId), and the new ad with its AdId is stored in ad database 30. DBS 16 then searches want ad database 32, in step 164, to determine if any of the previously stored want ads in want ad database 32 match the new ad just received from the seller. This step could of course be performed either before or after the new ad is actually placed in the ad database.

One preferred technique for performing this matching step is outlined in FIGURE 4. In this approach, the matching fields in the ad and want ad databases are broken down into basic fields (geographic area, price, bedrooms and bathrooms) and option fields (all remaining matching fields). In step 180, the first or next want ad is retrieved from the want ad database. Steps 182, 184, 186 and 188 then compare the basic fields of the new ad to those of the retrieved want ad. For example, step 182 compares the seller's geographical area from the new ad to the buyer's geographical area from the want ad. If the seller's area is not within the buyer's area, then there is no match, and control returns to block 180 to retrieve the next want ad. Steps 184, 186 and 188 perform similar tests for price, number of bedrooms and number of bathrooms. For price, the matching criteria is plus or minus 10%, while for bedrooms and bathrooms, the matching criteria is plus or minus one. These "tolerance" perimeters can be varied, and could also be specified by the buyer for each want ad.

If the basic field tests in blocks 182-188 are all successfully negotiated, then the option fields are tested. These fields include view, yard, garage, basement, fireplace, etc. For each option, if blocks 192 and 194 determine that the want ad requires the option but that the option is not present in the seller's ad, there is no match, and processing returns to step 180. On the other hand, if a given option is

not required, or is required and present, processing returns to block 190 to test the next option.

When all options have been successfully tested, a match has been found. In this case, in step 196, the AdId of the new ad is placed in a "callback queue", together with "delivery" information corresponding to the matching want ad. The delivery information preferably includes both the buyer's phone number, together with time information specifying the times that the phone number should be called. The delivery information may be contained in the want ad itself. Alternatively, the want ad may contain a buyer ID which is then used to retrieve the delivery information from buyer database 36. When processing of the want ad database is complete, control returns to step 156 in FIGURE 3. At this point, the operator determines if the seller has another new ad to place. If so, then the above described steps are repeated. If not, then processing proceeds to block 170 to perform various accounting functions, and the placement of the ad by the seller is complete.

As mentioned above, provision may also be made for experienced sellers such as real estate agents to fax ads to the system via PBX 12 and FAX server 18. In this case, the fax is printed or displayed to the operator of terminal 40, and the operator then inputs the information shown on the fax to create a new ad in ad database 30. In this case, the steps shown in FIGURE 4 are again carried out, to determine if the newly placed ad matches any previously stored want ads.

FIGURE 5 illustrates the callback routine that processes the records placed in the callback queue in step 196 of FIGURE 4. In step 200, the DBS scans the callback queue, to determine if any callbacks are scheduled to be made at the present time. As previously described, each callback record includes the buyer's phone number and time information concerning when callbacks should be directed to that phone number. Block 202 determines if the time information in any callback records matches the current date and time.

For callback records in which the time information matches, step 204 pulls such records from the callback queue, and sends them (in text form) to the IVR. In step 206, the IVR dials the buyer's phone number contained in the callback record, and waits for a response. If a voice response is not received, then the IVR sends a corresponding message to the DBS. The DBS then marks the time of the attempted callback in the callback queue record, so that a set period of time can be established between callback attempts in step 202. The callback routine resumes scanning in step 200. If a voice response is received, then in step 210, the IVR

sends a voice message to the buyer via the PBX, asking the buyer to make a predetermined touch tone response if the buyer would like the ad played at the present time. If the buyer's response is positive, then the IVR assembles a voice message by identifying the individual words and phrases contained in the ad, retrieving the digital voice records corresponding to such words and phrases, and concatenating the individual voice records into a single message. This message is then relayed to the buyer in voice form via telephone switch 12 and telephone line 20. When ad playback is complete, the IVR sends a corresponding message to the DBS, and the DBS removes the callback record from the queue in step 218, and then resumes scanning.

If the buyer does not wish to hear the ad played back at the present time, the buyer may provide a negative response. In this case the ad is not played back, but is removed from the callback queue, since the buyer has been notified that a matching ad exists in the system. The buyer may call in at a later time to retrieve the matching ad, as described immediately below. An option could also be provided to enable a buyer to request receipt of the ad via fax.

FIGURES 6 and 7 illustrate the steps performed when a buyer calls the system to request a search or to place a want ad. In general, a buyer's search request can be handled by an operator at terminal 40, as in the case of a seller placing an ad, or by IVR 14. The following discussion will assume that the buyer's search request is routed through the operator of terminal 40. However, analogous functions could be handled by the IVR, for systems in which a lower degree of flexibility is suitable.

Referring again briefly to FIGURE 2, for the case of a buyer's search request to be handled by an operator, IVR 14 will send an operator request message to DBS 16, as shown in step 116. Referring now to FIGURE 6, the operator at terminal 40 will then obtain information from the buyer, in step 250, in order to create a "profile" for the search request. In general, a "profile" corresponds to a want ad record, except that the profile has not yet been stored in the want ad database. Thus the information requested by the operator will correspond to the fields of the want ad database described above. The operator also obtains an output method from the buyer, e.g., voice or fax.

For the case in which the buyer's search request is being handled by the IVR, the IVR would at this point send the profile and the output method to DBS 16. However, for the case being considered in which the buyer's search request is handled by the operator, the DBS already has this data. In either case,

the DBS proceeds in step 252 to search ad database 30 for ads matching the profile. A preferred matching technique is described below. Block 254 then determines whether any matches have been found. If not, a suitable message is sent to the buyer in step 256, via either the operator or the IVR. Control then returns to block 250 to permit the buyer to specify a different profile or quit.

If step 254 determines that matches have been found, then step 260 determines the output method that the buyer has specified. If fax output has been specified, then step 262 sends the matching ads to FAX server 18 for output via PBX 12. Control then returns to step 250. If voice output has been specified, then step 264 sends the matching ads to IVR 14. In step 266, the IVR proceeds to play the matching ads back to the buyer. This process is also further described below. In step 270, the buyer is then asked whether it wishes to convert the currently searched profile into a want ad. If the buyer's response is affirmative, then the IVR sends a corresponding message to DBS 16, and the DBS proceeds to store the profile as a new want ad in want ad database 32. In both cases, control then returns to step 250.

FIGURE 7 provides additional details concerning a preferred technique for searching the ad database for matches, as performed in step 252 of FIGURE 6. In step 280, the profile is matched to ads in ad database 30, using only the basic fields. As described above, in the embodiment being described relating to residential real estate, the basic fields are geographic area, price, number of bedrooms and number of bathrooms. The matching criteria and tolerances may be selected to be identical to those shown in steps 182-188 of FIGURE 4. In step 282 of FIGURE 7, the number of matching ads is compared to a maximum number RMAX. If the number of matches is less than or equal to RMAX, then the searching step is complete, and control is returned to step 254 in FIGURE 6. However, for the case in which the number of matching ads exceeds RMAX, then the buyer is prompted in step 284 to specify one of the option fields not previously specified during this search. Examples of option fields are: view?, large yard?, garage?, etc. The database query is then rerun in step 286 using the basic fields and the option fields that have been specified to this point. The number of retrieved ads is again compared to RMAX in step 282, and this loop continues until the number of ads retrieved is within the RMAX limit. If this limit is never reached, then the first RMAX ads are transmitted to the buyer.

FIGURE 8 illustrates a preferred, interactive technique for carrying out the playback of matching ads by the IVR, in step 266 of FIGURE 6. As in the case of

playback of the callback queue described above, the IVR performs the playback by assembling a voice message in real time. The voice message is assembled by identifying the individual words and phrases contained in the ad, retrieving the digital voice records corresponding to such words and phrases, and concatenating the individual voice records into an output message. For the purpose of this playback, the fields in each ad are preferably separated into "summary" fields and "detail" fields. For example, summary fields could include geographic area, price and house style, and all remaining fields could be treated as detail fields. In general, the summary fields of the ads are assembled and played back sequentially, beginning with the first ad in step 300, and ending with the last ad in step 310. However, during the playback, the buyer can control the sequence using predetermined touch tone keys. For example, one touch tone key would correspond to the illustrated "More" function that causes the detail fields of the current ad to be assembled and played back. If the More function is not used, then detail fields are omitted. A second touch tone key would correspond to the repeat function, which causes either a repeat of the summary fields of the current ad if details are currently being played back, or causes the prior ad to be played back in the case of summary playout. A third key would be dedicated to the skip function which causes the playback to skip ahead to the next ad in the sequence.

While the preferred embodiment of the invention has been illustrated and described, it will be appreciated that various changes can be made therein without departing from the spirit and scope of the invention.

CLAIMS:

1. A computer-based classified ad system, the system comprising:

(a) Data Processing means including:

(1) means for receiving new advertising data via a telecommunications system,

(2) means for creating an ad database comprising a plurality of ads stored in a memory, including ads which comprise said new advertising data received via the telecommunications system, each of said plurality of ads describing an item to be made available such as property offered, services available or employment available;

(3) means for receiving profile data describing an item sought from others, such a property desired, services desired or employment sought;

(4) means for comparing the profile data to the ads in the ad database to determine if any of the ads are sufficiently similar to the profile data and, if so, for generating output data comprising information in the ads that matches the profile; and

(b) an interactive response system comprising means for storing individual words or phrases, means for receiving said output data and means for assembling an output message corresponding to the output data.

2. A computer-based classified ad system as claimed in claim 1 wherein said telecommunications system comprises a telephone system.

3. A computer-based classified ad system, as claimed in claim 1, wherein said interactive response system is an interactive voice response system.

4. A computer-based classified ad system, as claimed in claim 1, further comprising:

means for receiving commands from a user, including a first command to initiate communication with an operator, and

means for initiating communication with an operator in response to said first command.

5. A computer-based classified ad system, as claimed in claim 1, further comprising

means for receiving information needed to change an existing ad or renew an expiring ad and for automatically changing the existing ad or automatically renewing the expiring ad in response to receipt of such information.

6. A computer-based classified ad system, as claimed in claim 1 wherein each ad has an identification number associated therewith.

7. A computer-based classified ad system, as claimed in claim 6 wherein a user can receive at least some of the contents of an ad by inputting said identification number.

8. A computer-based classified ad system, as claimed in claim 6 wherein a user can input an identification number and, in response, receive the contents of ads, different from the add associated with said identification number, which are sufficiently similar to said ad associated with said identification number.

9. A computer-based classified ad system, as claimed in claim 1 wherein said interactive response system places said output message in a storage queue, with other messages.

10. A computer-based classified ad system, as claimed in claim 9 wherein said interactive response system includes means for scanning said queue and attempting transmission of messages in said queue.

11. A computer-based classified ad system, as claimed in claim 10 wherein said interactive response system maintains said output message in said queue for a later transmission attempt if there is no response to said attempted transmission.

12. A computer-based classified ad system, as claimed in claim 1 further comprising means for receiving and storing information regarding the transmission preferences of a user.

13. A computer-based classified ad system, as claimed in claim 12 wherein said transmission preference includes information regarding the time for transmission preferred by the user.

14. A computer-based classified ad system, as claimed in claim 12 wherein said transmission preference includes information regarding the medium of transmission preferred by the user.

15. A computer-based classified ad system, as claimed in claim 1, further comprising means for receiving commands from the user to control features of the transmission of said output message, such as skipping, postponing or repeating a portion of said output message.

16. A computer-based classified ad system, as claimed in claim 1 further comprising means for receiving a command to store said profile data so as to convert said profile data into a stored want ad; and

means for comparing said stored want ad to at least one ad which is placed in said ad database after said receipt of said profile data and generating output data comprising information in the ads that is sufficiently similar to said stored want ad.

17. A computer-based classified ad system, the system comprising:

(a) Data processing means including:

(1) means for creating an ad database comprising a plurality of ads, each of said plurality of ads describing an item to be made available such as property offered, services available or employment available, each of said plurality of ads comprising at least one basic field, each basic field being associated with a particular aspect of the item;

(2) means for receiving profile data describing items sought from others, such as property desired, services desired or employment sought;

(3) means for comparing the profile data to the ads in the ad database by comparing the profile data to at least said basic field information to determine if an of the ads are sufficiently similar to the profile data and, if so, for generating output

data comprising information in the ads that matches the profile; and

(b) an interactive voice response system comprising means for storing individual sounds in voice form, means for receiving said output data and means for assembling an output message corresponding to the output data.

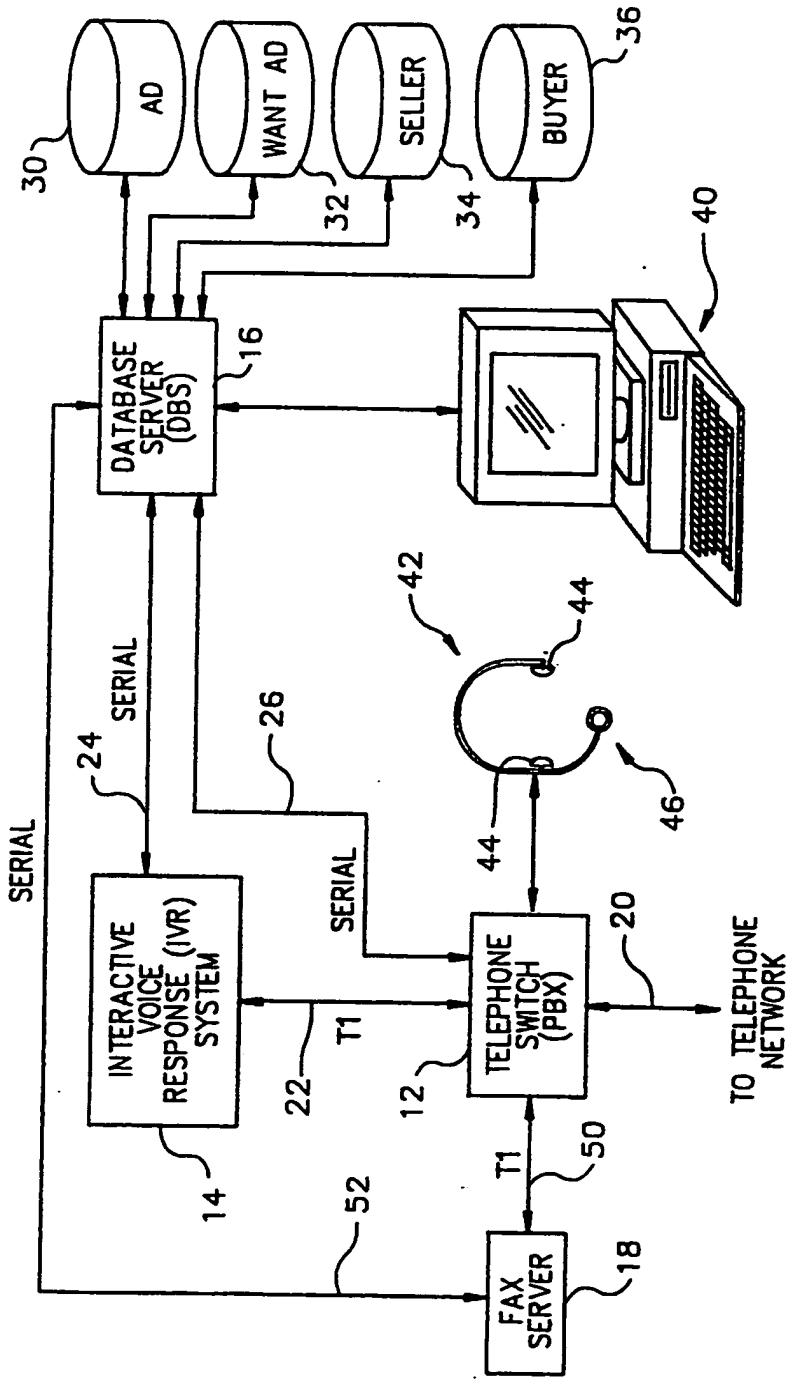

AD
WANT AD
SELLER
BUYER
30
32
34
36
40
DATABASE SERVER (DBS)
16
SERIAL
24
26
42
44
46
INTERACTIVE VOICE RESPONSE (IVR) SYSTEM
14
T1
22
TELEPHONE SWITCH (PBX)
12
20
TO TELEPHONE NETWORK
T1
50
52
FAX SERVER
18

FIG. 1

FIG. 2

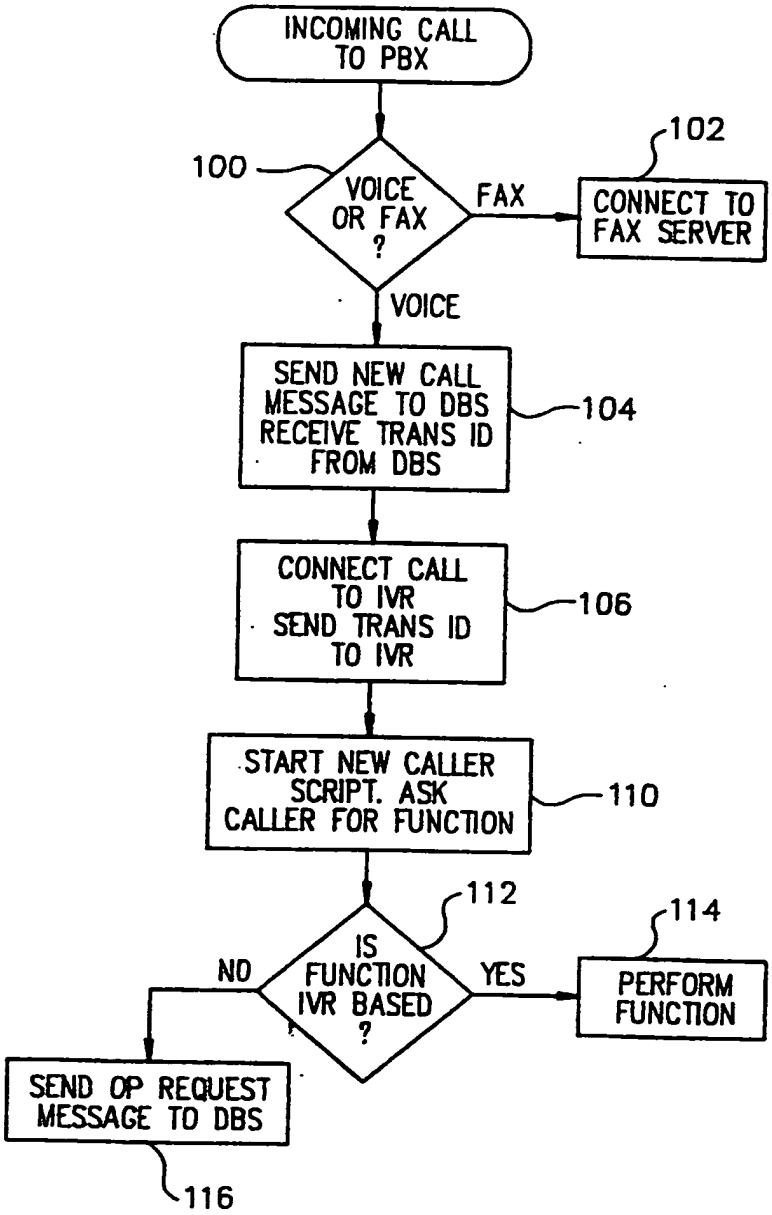

INCOMING CALL TO PBX
100
VOICE OR FAX ?
FAX
102
CONNECT TO FAX SERVER
VOICE
SEND NEW CALL MESSAGE TO DBS RECEIVE TRANS ID FROM DBS
104
CONNECT CALL TO IVR SEND TRANS ID TO IVR
106
START NEW CALLER SCRIPT. ASK CALLER FOR FUNCTION
110
112
IS FUNCTION IVR BASED ?
NO
YES
114
PERFORM FUNCTION
SEND OP REQUEST MESSAGE TO DBS
116

FIG. 3

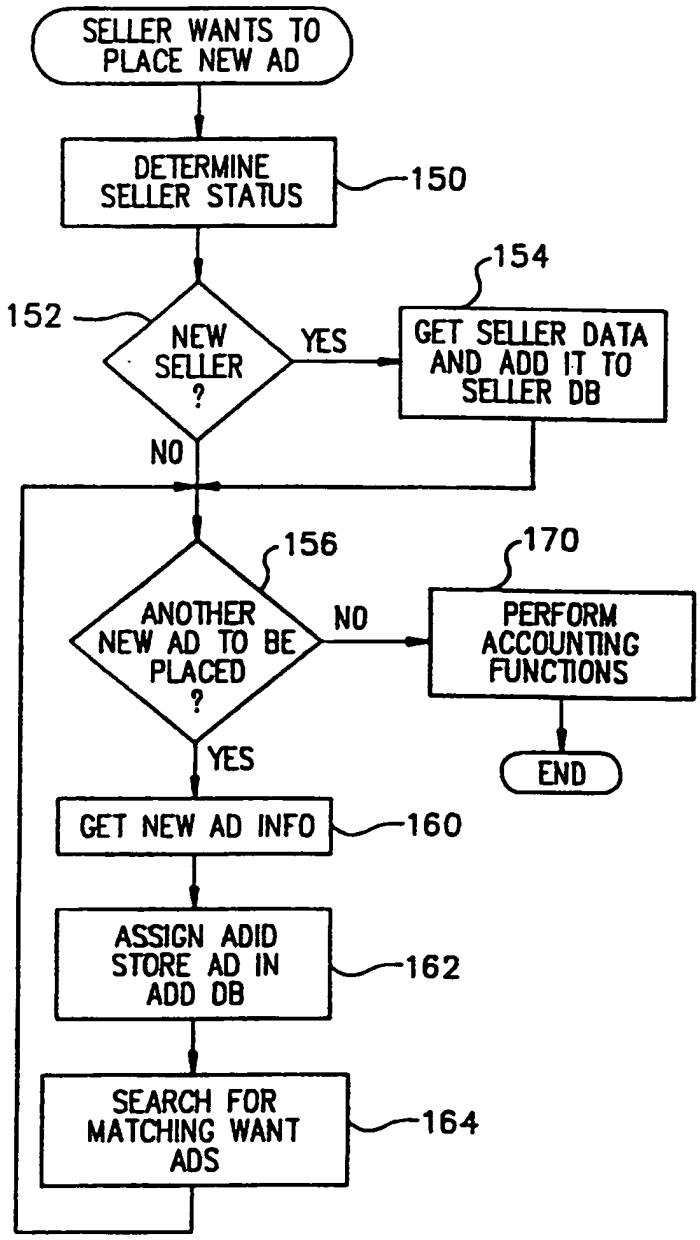

SELLER WANTS TO PLACE NEW AD
DETERMINE SELLER STATUS
150
152
NEW SELLER ?
YES
154
GET SELLER DATA AND ADD IT TO SELLER DB
NO
156
ANOTHER NEW AD TO BE PLACED ?
NO
170
PERFORM ACCOUNTING FUNCTIONS
END
YES
GET NEW AD INFO
160
ASSIGN ADID STORE AD IN ADD DB
162
SEARCH FOR MATCHING WANT ADS
164

FIG. 4

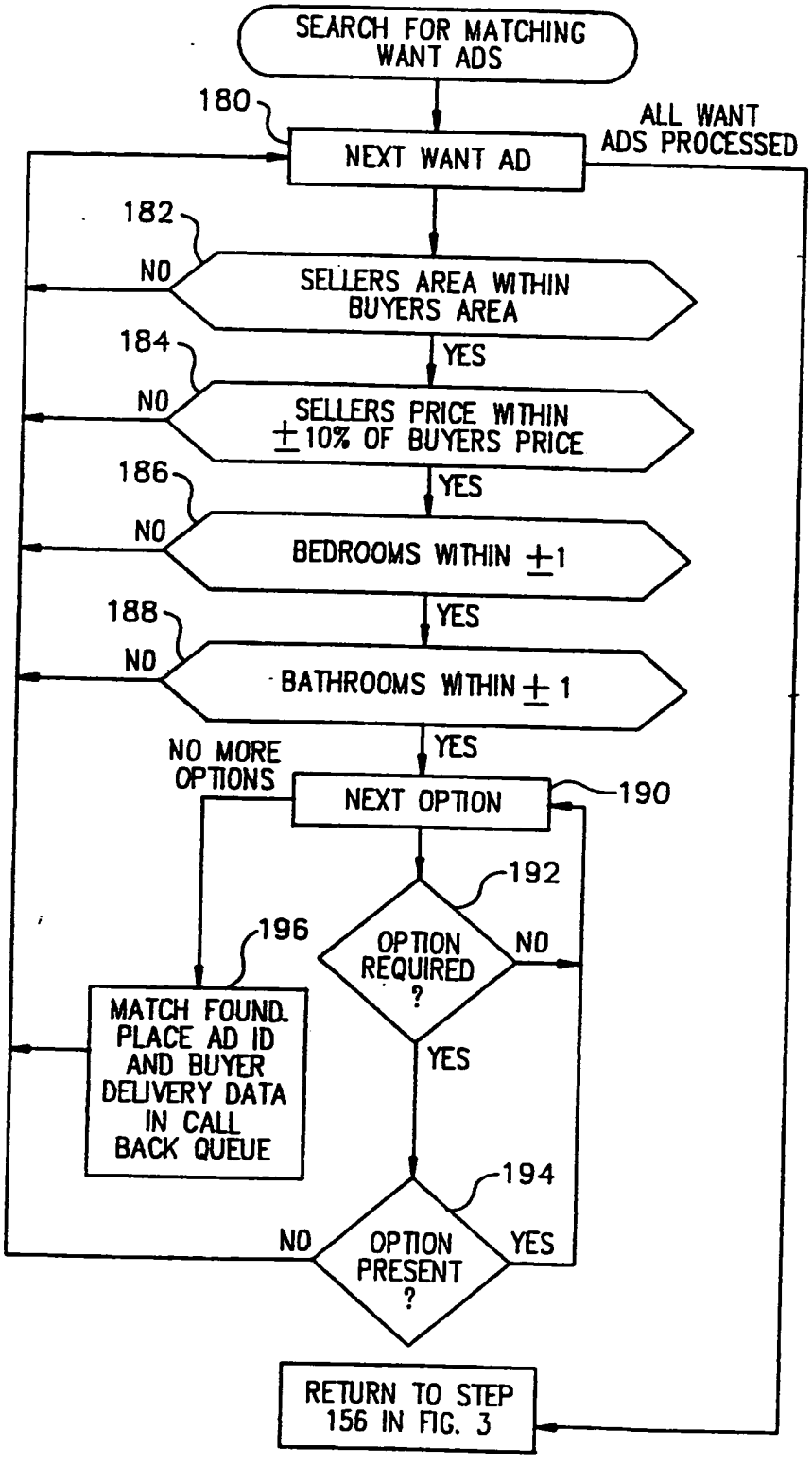

SEARCH FOR MATCHING WANT ADS
180
NEXT WANT AD
ALL WANT ADS PROCESSED
182
NO
SELLERS AREA WITHIN BUYERS AREA
YES
184
NO
SELLERS PRICE WITHIN ±10% OF BUYERS PRICE
YES
186
NO
BEDROOMS WITHIN ±1
YES
188
NO
BATHROOMS WITHIN ± 1
YES
NO MORE OPTIONS
NEXT OPTION
190
192
OPTION REQUIRED ?
NO
YES
196
MATCH FOUND. PLACE AD ID AND BUYER DELIVERY DATA IN CALL BACK QUEUE
194
NO
OPTION PRESENT ?
YES
RETURN TO STEP 156 IN FIG. 3

FIG. 5

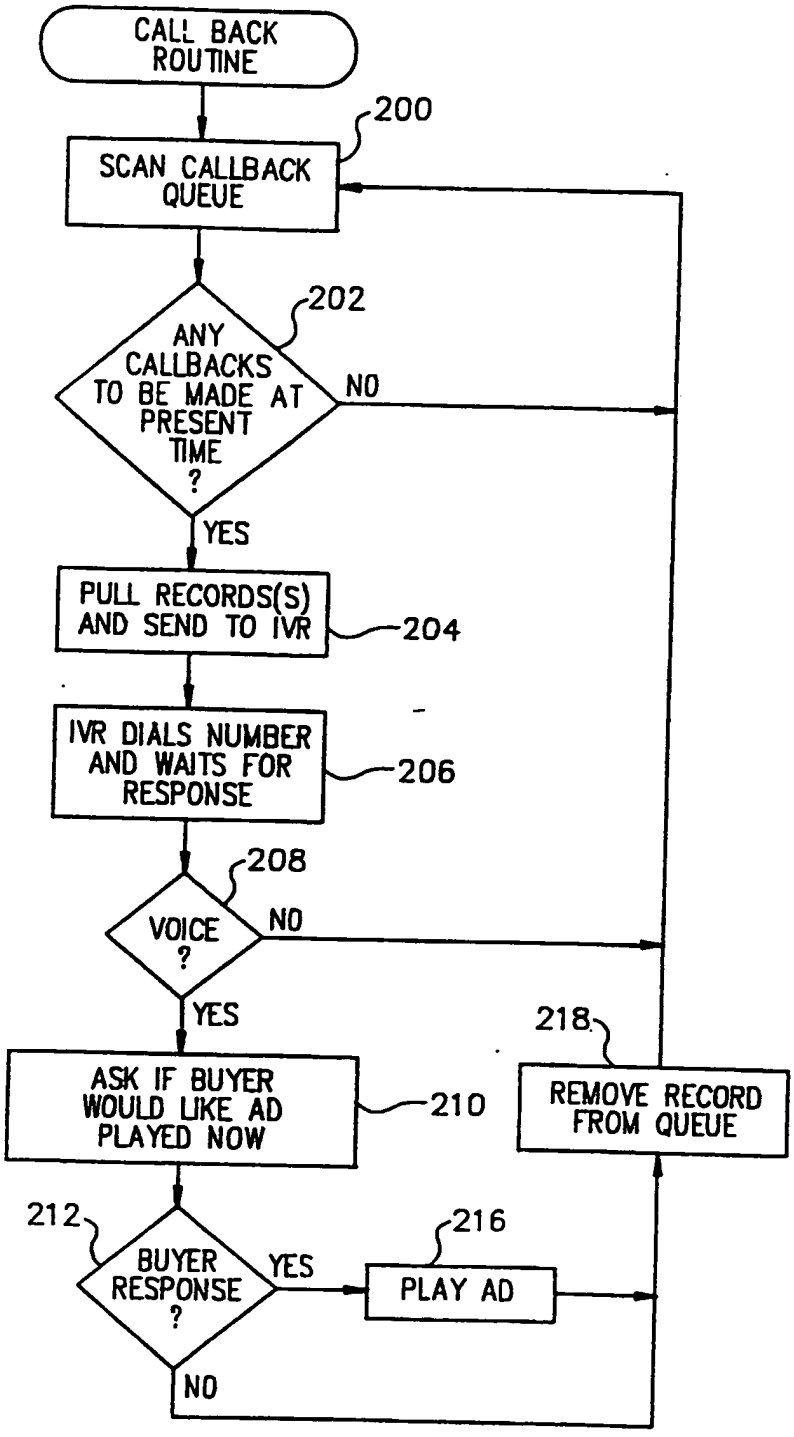

CALL BACK ROUTINE
200
SCAN CALLBACK QUEUE
202
ANY CALLBACKS TO BE MADE AT PRESENT TIME ?
NO
YES
PULL RECORDS(S) AND SEND TO IVR
204
IVR DIALS NUMBER AND WAITS FOR RESPONSE
206
208
VOICE ?
NO
YES
218
ASK IF BUYER WOULD LIKE AD PLAYED NOW
210
REMOVE RECORD FROM QUEUE
212
BUYER RESPONSE ?
YES
216
PLAY AD
NO

FIG. 6

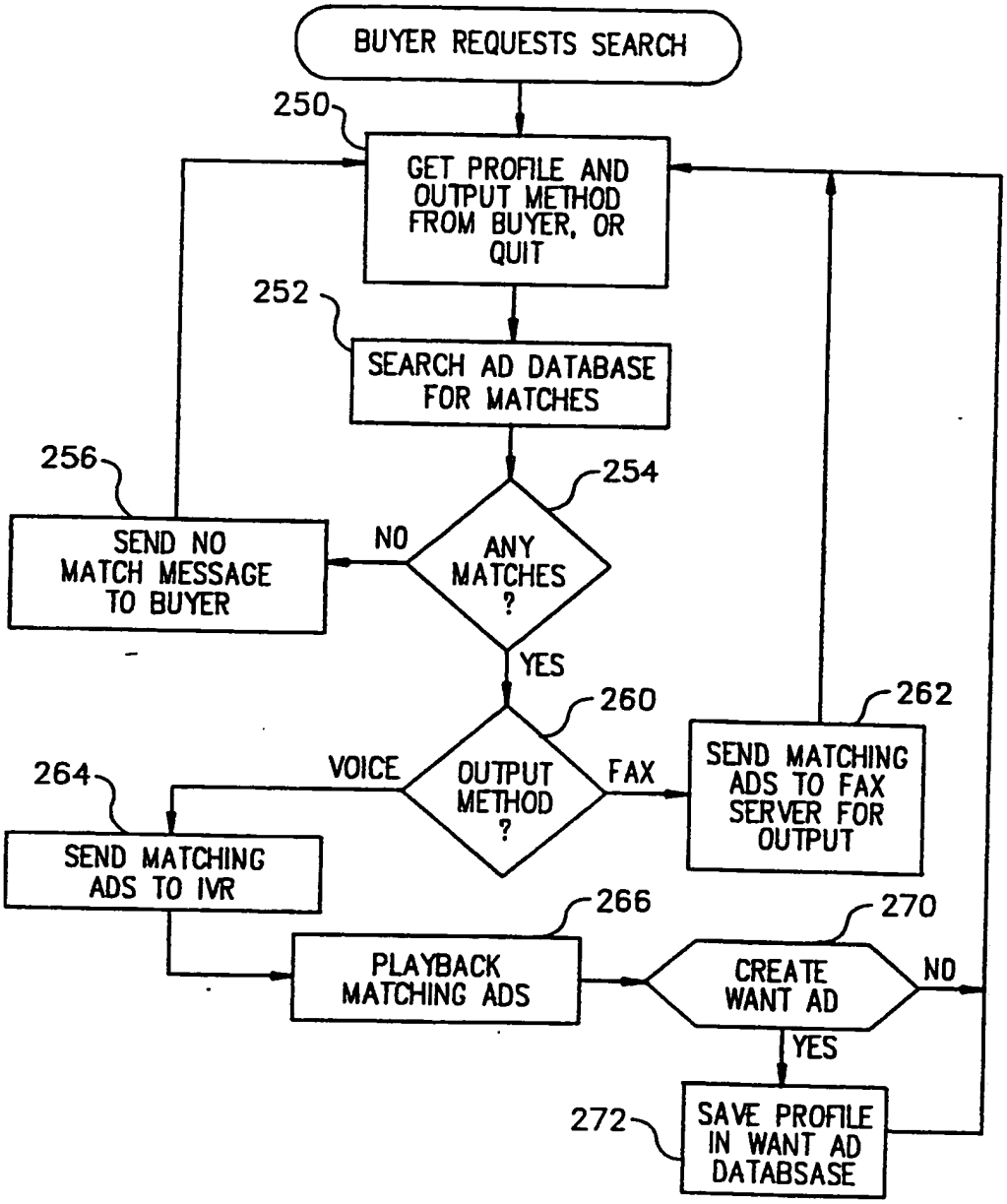

BUYER REQUESTS SEARCH
250
GET PROFILE AND OUTPUT METHOD FROM BUYER, OR QUIT
252
SEARCH AD DATABASE FOR MATCHES
254
ANY MATCHES ?
NO
256
SEND NO MATCH MESSAGE TO BUYER
YES
260
OUTPUT METHOD ?
VOICE
FAX
262
SEND MATCHING ADS TO FAX SERVER FOR OUTPUT
264
SEND MATCHING ADS TO IVR
266
PLAYBACK MATCHING ADS
270
CREATE WANT AD
NO
YES
272
SAVE PROFILE IN WANT AD DATABSASE

FIG. 7

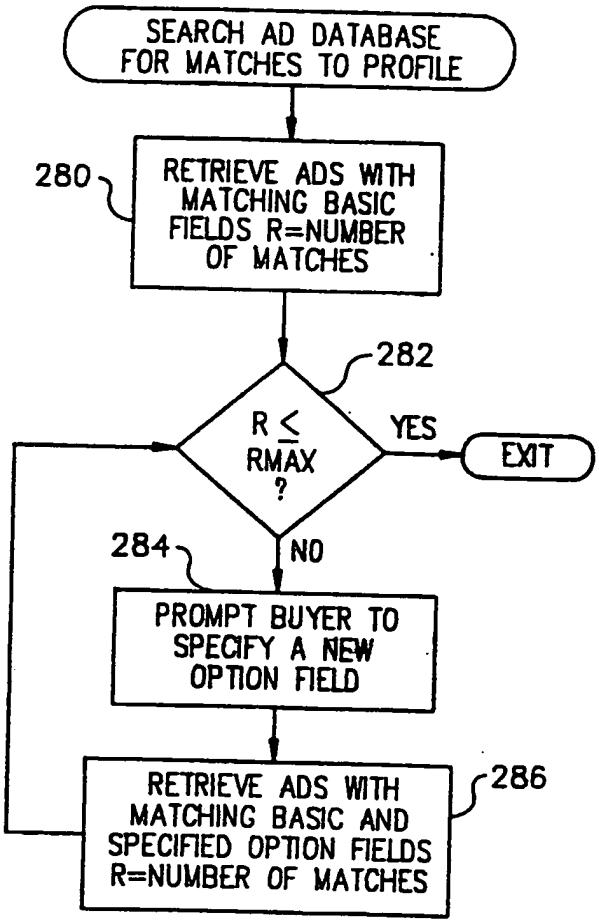
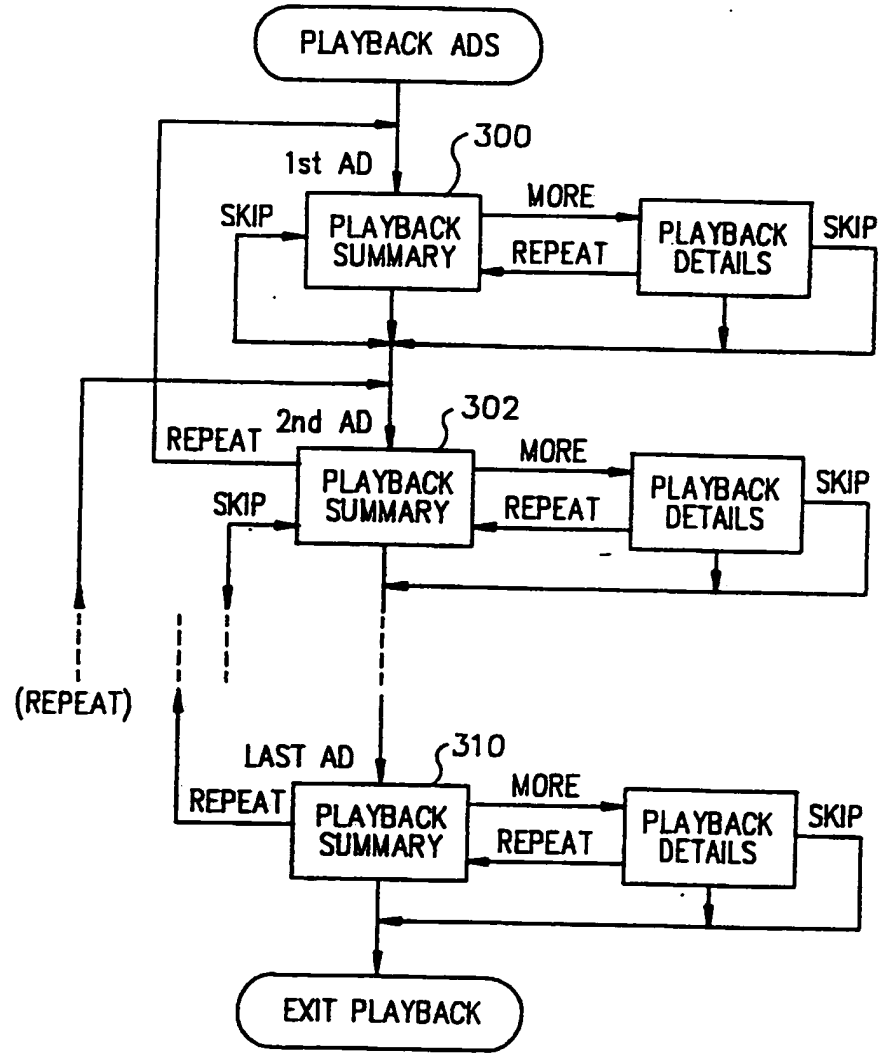

SEARCH AD DATABASE FOR MATCHES TO PROFILE
280
RETRIEVE ADS WITH MATCHING BASIC FIELDS R=NUMBER OF MATCHES
282
R ≤ RMAX ?
YES
EXIT
NO
284
PROMPT BUYER TO SPECIFY A NEW OPTION FIELD
286
RETRIEVE ADS WITH MATCHING BASIC AND SPECIFIED OPTION FIELDS R=NUMBER OF MATCHES

FIG. 8


PLAYBACK ADS
1st AD
300
SKIP
PLAYBACK SUMMARY
MORE
REPEAT
PLAYBACK DETAILS
SKIP
REPEAT
2nd AD
302
PLAYBACK SUMMARY
MORE
REPEAT
PLAYBACK DETAILS
SKIP
SKIP
(REPEAT)
LAST AD
310
REPEAT
PLAYBACK SUMMARY
MORE
REPEAT
PLAYBACK DETAILS
SKIP
EXIT PLAYBACK

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US93/06007

A. CLASSIFICATION OF SUBJECT MATTER

IPC(5) :G06F 15/21
US CL : 364/401

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 364/401, 403, 408
379/67, 84, 88

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, A, 4,645,873 (Chomet) 24 Febuary 1987, see entire document, particularly col. 3, lines 50+ and col. 4, lines 37-44 and 66+.	1-17
Y	US, A, 4,757,267 (Riskin) 12 July 1988, see col. 5, lines 31+ through col. 6.	1-17
Y	US, A, 4,577,062 (Hilleary et al.) 18 March 1986, see entire document.	1-17
Y	US, A, 5,058,152 (Solomon et al.) 15 October 1991, see entire document.	1-17
Y	US, A, 4,847,890 (Solomon et al:) 11 July 1989, see entire document, particularly col. 6, lines 23-59.	1-17

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
21 September 1993	18 OCT 1993
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. NOT APPLICABLE	Authorized officer DONALD McELHENY, JR. Telephone No. (703) 305-3894

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